

## Worksheet 6.1 I: Similarity

Express the ratio in simplest form.

1.  $\frac{16}{20}$       2.  $\frac{6m}{10m}$       3.  $\frac{4x^2}{2x^2}$       4.  $\frac{6a}{12abc}$

Find the value of x.

5.  $\frac{4}{x} = \frac{2}{3}$

6.  $\frac{2}{5} = \frac{3x}{7}$

7.  $\frac{x+2}{3} = \frac{3}{4}$

$$\frac{2}{5} = \frac{3x}{7}$$

8.  $\frac{x+4}{x-4} = \frac{6}{5}$

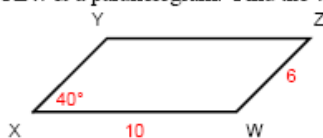
9.  $\frac{3x+5}{3} = \frac{18x+5}{7}$

10.  $\frac{2x+1}{4x-1} = \frac{3}{5}$

$$\frac{14}{15} = \frac{15x}{15}$$

$$x = \frac{14}{15}$$

XYZW is a parallelogram. Find the value of each ratio.



11.  $XW : WZ$

12.  $XY : WZ$

13.  $m\angle Z : \angle Y$

14.  $m\angle X : m\angle Z$

15.  $XY : \text{perimeter of } XYZW$

Decide whether the two polygons are Always, Sometimes, or Never similar.

16. Two right triangles.

17. Two scalen triangles.

$$\frac{2x+1}{4x-1} = \frac{3}{5}$$

$$12x - 3 = 10x + 5$$

$$+3 \quad +3$$

$$12x = 10x + 8$$

$$-10x \quad -10x$$

$$\frac{2x}{2} = \frac{8}{2} \quad \boxed{x=4}$$

18. Two equilateral triangles.

19. Two isosceles triangles.

20. Two squares.

21. Two rectangles.

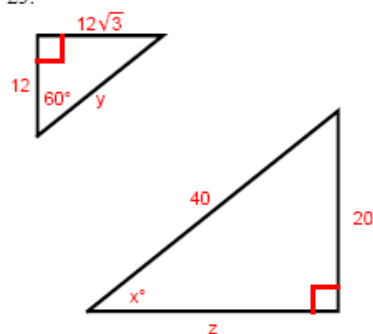
22. A right triangles and an acute triangle.

23. A right triangle and a scalene triangle.

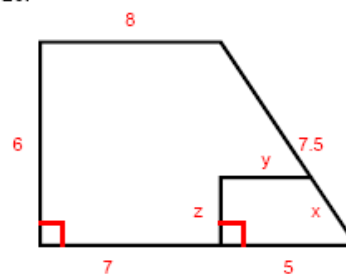
24. An equilateral triangle and an equiangular triangle.

Two similar polygons are shown. Find the values of  $x$ ,  $y$ , and  $z$ .

25.

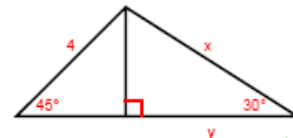
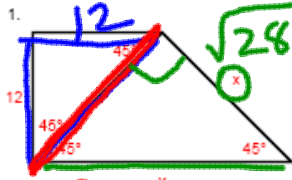


26.



# Worksheet 6.3: Special Right Triangles

Find the values of x and y in each diagram.



$$a^2 + b^2 = c^2$$

$$12^2 + 12^2 = c^2$$

$$144 + 144 = c^2$$

$$288 = c^2$$

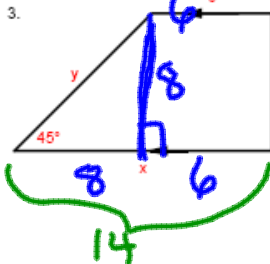
$$\sqrt{288} = c$$

$$288 + 288 = c^2$$

$$576 = c^2$$

$$\sqrt{576} = c$$

①  $x = \sqrt{288}$   
 $y = 24$



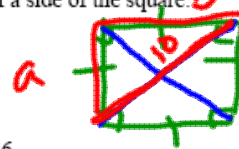
$$x = 14$$

$$64 + 64 = c^2$$

$$128 = c^2$$

$$c = \sqrt{128} = y$$

4. The diagonals of a square are 10 units long. Find the length of a side of the square.



$$100 = a^2 + b^2$$

$$100 = a^2 + a^2$$

$$100 = 2a^2$$

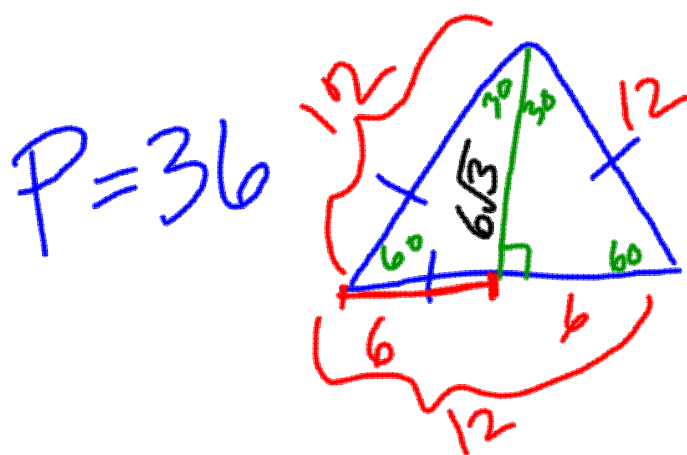
$$\frac{100}{2} = \frac{2a^2}{2}$$

$$50 = a^2$$

$$\sqrt{50} = a$$

5. Find the length of a diagonal of a square whose perimeter is 36.

6. An altitude of an equilateral triangle has length  $6\sqrt{3}$ . What is the perimeter of the triangle.

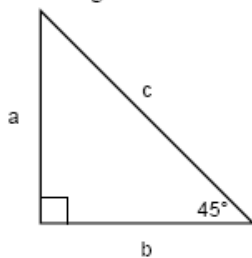


$$\frac{6\sqrt{3}}{\sqrt{3}} = 6$$

7. Find the altitude of an equilateral triangle if each side is 10 units long.

8. If the measures of the angles of a triangle are in the ratio 1 : 2 : 3, are the lengths of the sides in the same ratio?

Use the figure below to complete the each exercise.



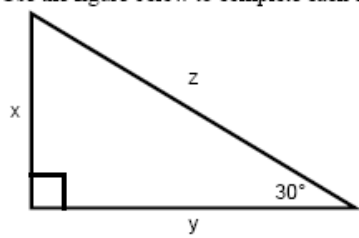
9. If  $a = 8$ , then  $c =$  \_\_\_\_\_.

10. If  $b = 2\sqrt{3}$ , then  $c =$  \_\_\_\_\_.

11. If  $c = \sqrt{5}$ , then  $a =$  \_\_\_\_\_.

12. If  $c = 12$ , then  $b =$  \_\_\_\_\_.

Use the figure below to complete each exercise.



13. If  $x = 10$ , then  $y =$  \_\_\_\_\_ and  $z =$  \_\_\_\_\_.
14. If  $y = 10$ , then  $x =$  \_\_\_\_\_ and  $z =$  \_\_\_\_\_.
15. If  $z = 12$ , then  $x =$  \_\_\_\_\_ and  $y =$  \_\_\_\_\_.
16. If  $z = 4\sqrt{6}$ , then  $x =$  \_\_\_\_\_ and  $y =$  \_\_\_\_\_.